

# Does the frequency of hypoglycemia influence attention in children with type 1 diabetes?

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## Introduction

Type 1 diabetes may have an influence on concentration, attention and behavior. These effects are relevant, as they may affect school performance and later career options for pediatric diabetes patients [1]. This study examined attention, concentration and behavioral difficulties in diabetic children aged 5-13 years and their association with hypoglycemic episodes and HbA<sub>1c</sub>.

	Mean ± SD	Range
Age (y)	9,4 ± 2,3	5,2 – 13,5
Diabetes duration (y)	3,5 ± 2,5	0,3 – 10
HbA <sub>1c</sub> 2 year Median (%)	7,5 ± 0,9	5,9 – 10
Length (cm)	137,1 ± 15,8	111 - 169
Weight (kg)	35,0 ± 12,0	17,5 – 67,8
BMI (kg/m <sup>2</sup> )	18,6 ± 3,5	13,5 – 28,7
Current blood glucose (mg/dl)	175 ± 66	60 – 301

## Results

- Attention was significantly better in patients with 1-5 hypoglycemic episodes compared to patients with > 5 episodes.
- No correlation between HbA<sub>1c</sub> and attention.
- No correlation with HbA<sub>1c</sub> and behavioral abnormalities

## Patients/Methods

- 48 children with type 1 diabetes mellitus (28 boys, 20 girls)
- Stratification for:
  - HbA<sub>1c</sub> (good diabetes control HbA<sub>1c</sub> < 7,5%; average or bad diabetes control HbA<sub>1c</sub> > 7,5%)
  - number of hypoglycemia per month (<1 episode/month, 1-5 episodes/month, >5 episodes/month).
- Assessment of behavioral problems with Strength and difficulties questionnaire (SDQ, [2])
- Assessment of attention with KiTAP (computer based testing of selectivity, intensity, flexibility and control of impulse in the patients [3])
- Statistics: Mann-Whitney-U-tests for group differences. Spearman's rank correlation coefficients for correlations.



## Discussion

- Recent hypoglycemia seems to affect attention
- No permanent cognitive impairment by hypoglycemia
- In our population, no correlation between HbA<sub>1c</sub> and attention occurred
- Good diabetes control with absence of hypoglycemia should be achieved to allow children to develop according to their potential

## Literature

- 1)Gaudieri PA., Chen R., Greer TF., Holmes CS. (2008) Cognitive function in children with type 1 diabetes: a meta-analysis. Diabetes Care. 31(9):1892-7
- 2)Woerner W., Becker A., Friedrich C., Klasen H., Goodman R., Rothenberger A. (2002) Normierung und Evaluation der deutschen Elternversion des Strengths and Difficulties Questionnaire (SDQ): Ergebnisse einer repräsentativen Felderhebung. Zeitschrift für Kinder-und Jugendpsychiatrie und Psychotherapie. 30(2):105-12
- 3)Zimmermann P., Gondan M., Fimm B. (2002) KITAP Testbatterie zur Aufmerksamkeitsprüfung für Kinder. Psytest, Herzogenrath, S.7-32

